4 ADAPS MENUS AND PROGRAMS

by Colleen A. Babcock and James F. Cornwall

This section describes the standard ADAPS menu system and associated program modules, which are invoked by the menu options. The system is designed to group the ADAPS programs into categories which reflect the normal workflow patterns associated with processing, reviewing, and publishing data. The menus are also designed to allow for modification by local administrators to add or rearrange menu options as needed to meet local requirements. This function is described in the ADAPS Database Administrator Manual. The following sections describe the usage of the menus and the programs associated with each menu option selectable by the user. Once in ADAPS, the user can perform work tasks either by (1) selecting menu options in the main menu and submenus to invoke the programs associated with the selections, or (2) by directly entering the name of the ADAPS program module that performs the desired task. This dual mode of operation allows the novice user to make menu choices in an organized fashion that follows the usual processing methods for taking water data from input to final publication, while allowing more advanced users to go directly to specific programs without having to navigate a menu hierarchy.

4.1 Introduction

The ADAPS software is designed to be primarily menu-driven, with interactive menus offering the user choices appropriate to system access level and the functional tasks required to process water data. The software is also designed to allow more experienced users to bypass the menus by entering program names directly on the command line or by "stacking" command options to navigate several menu steps in one command.

The ADAPS menu is invoked simply by entering (at the UNIX command prompt) the command "adaps". If this command does not start up ADAPS and bring up the menus, see the Site Administrator to verify access and permissions to run ADAPS and the correct environment settings to do so.

The ADAPS menu system consists of the main menu and a number of associated submenus, invoked by selecting a two-letter code for the desired choice. Each of the main menu options describes a separate functional category in processing water data. For example, the command "IN" will invoke the "Data Input" submenu and present the user with a list of programs used to bring data into ADAPS for processing, while the "PR" command will invoke the "Primary Data Processing" submenu with a list of programs to actually perform the processing of the data. When invoked, the submenus for each functional category will have their own numeric menu options for selecting specific tasks/programs. When a specific submenu option is selected, ADAPS will execute the program associated with that task and transfer control of the screen to that program until it exits back to the ADAPS menus. Further menus, prompts, or questions may be displayed by the individual programs. The processing performed by the program modules may be interactive or may be completed later as a batch job (no terminal communication required).

A set of additional menu options are provided for the main menu and all submenus that provide for common tasks, such as movement within the menus, exiting from ADAPS, listing individual programs by name, and getting online documentation for ADAPS. The "QU" command will take the user back to the previous menu (i.e. from a submenu to the main menu, or from a program query to a submenu), and the "EX" command will take the user out of ADAPS back to the UNIX command prompt. The command "PGM" will provide a list of all the ADAPS program names and a brief description of each. When the user enters "doc nn" (where "nn" is the 1- or 2-character menu option) or "doc name" (where "name" is the actual program name as listed from the "PGM" command), an online description for each main menu's or program's options and functions is displayed.

Experienced users may speed up operation of ADAPS tasks by stacking commands. For example, a user may enter "PR 7" in the command line to go directly to the 7th task/program listed in the "Primary Data Processing" submenu (the PRIMARY program). If desired, the user may even enter "adaps PR 7" from the UNIX command line to go directly to the program. The main menu and submenus are interconnected so that the user can move from submenu to submenu or from submenu to main menu, etc., rather than having to return to the main menu only. For example, after completion of the PRIMARY program from the "PR" menu, the user may enter "DI" in the command line of the "PR" submenu and be taken directly to the Data Display "DI" menu without going through the main menu.

Programs may be invoked by selection from more than one submenu. For example, the program to produce tables of Unit Values (uv_table) may be found in both the "DI" and "PR" submenus, as it serves a function utilized in both work task categories. Repeating the option in different menus saves the user from having to move from the current menu to another in order to obtain a table, thereby saving time while doing a particular task.

Another feature of the ADAPS menu system is the capability to select tasks by entering in the command line the actual name of the program, rather than invoking the program via a submenu option. The program name may be entered at any ADAPS command prompt, and does not require the program to be listed in the menus. For example, the user could enter "uv_table" from the main menu and be taken directly to the Unit Values tabling program. Entering "pgm" in the command line will produce a list of all the ADAPS program names and a brief description of each program's function.

The options a user will see on the ADAPS menus depend upon access level in the system. ADAPS has four levels of user access: System Administrators ("SYST"), ADAPS Database Administrators ("ADBA"), Standard Users ("USER"), and Cooperators ("COOP"). "SYST"-level users will be able to see all menus and all options within the menus. "ADBA"-level users see all menus, but certain menu options are blocked (those programs coded for access only by "SYST" users in the menu definition files). "USER"-level users cannot see the menus for maintaining the database and support functions, and within the remaining submenus they see options related to records processing and data retrieval (programs coded for "USER" or "COOP" access). "COOP"-level users will only see options for retrieval of data (programs coded for "COOP" access only).

Capabilities are provided to allow District ADAPS System Administrators to change the ADAPS access levels of the ADAPS programs, thereby tailoring the ADAPS system to a particular District's needs. If Districts change the access levels, the numbering of submenu options may differ from District to District, and possibly from user-access level to user-access level within a District. Adding programs to the ADAPS menu system and the user-access files are discussed in the NWIS Administrator's Manual.

Since the submenus under the main menu may vary from District to District, they may differ from those shown here. The emphasis in this manual is to group the different work tasks by their functional work task category, and to refer to the actual program names (uv_table, dd_disp, etc), rather than by the two-letter main menu and numeric submenu options. The menus presented in the following sections are the standard default menus provided with the ADAPS software.

4.2 Functional Categories

Sections 4.4 through 4.11 of this manual contain documentation for the various ADAPS programs arranged by functional category. Only those programs coded for use by "COOP" and "USER" users are presented in this manual; "SYST" and "ADBA" access-level programs are described in the ADAPS Database Administrator's Manual. The table below lists the functional categories and a brief description of each one.

Option	Functional Category	Description	Section
IN	DATA INPUT	Bring data into the ADAPS system	4.4
PR	PRIMARY PROCESSING	Perform primary processing of data	4.5
AP	APPLICATIONS	ADAPS Statistical Applications	4.6
DI	DATA DISPLAY	Display and print UV and DV data	4.7
RT	DATA RETRIEVAL	Retrieve and write ADAPS data	4.8
SU	SUPPORT FUNCTIONS	Updating site/location information	4.9
MA	MAINTAIN DATABASE	Manage DB & Users, data archival	4.10
UT	UTILITIES	Miscellaneous Utility functions	4.11

The following section shows screen shots of the default ADAPS menus. The screen shots are arranged in the order shown in the table above.

```
| US. GEOLOGICAL SURVEY AUTOMATED DATA PROCESSING SYSTEM (ADAPS)
MAIN MENU - WATER DATA PROCESSING OPTIONS
*******************
    IN -- Data Input
    PR -- Primary Data Processing
    AP -- ADAPS Statistical applications
    DI -- Data Display
    RT -- Data Retrieve/Write
    SU -- Update Support Files/Record Flags
    MA -- Maintain Database
    UT -- Miscellaneous Utility Functions
    LA -- Local Applications
    DOC menu opt -- Display documentation PGM -- Display program names
    QU -- Exit to previous menu
                                   EX -- Exit to UNIX
Select desired menu option or program name ([CR] for menu):
```

ADAPS Main Menu

The user may select submenus using the two-letter options for the functional categories, enter program names directly, or display program names or documentation using the appropriate command. All menu options are shown in this display, but users at access levels "USER" and "COOP" will not be able to see the "SU" and "MA" menu options.

```
*************************
     US. GEOLOGICAL SURVEY AUTOMATED DATA PROCESSING SYSTEM (ADAPS)
| REVISION NWIS 4 2 0-20020402
                                  Jun 03, 2002 15:11:23 Monday |
                      (IN) SUB-MENU : Data Input
********************
1 -- Read ADR Tape Data
2 -- Process ADR Card-Image Data
3 -- Edit And Store ADR Tape Data
4 -- Review/Delete Digital Tape Temp. Files
5 -- Process UV Card-Image Data
6 -- Enter Unit-Values from Digitizer/Keyboard
7 -- Process Daily-Values Card-Image Data
8 -- Process WRD standard input data
9 -- Enter/Update/Display Measurements
FROM THE PREVIOUS MENU -- IN, PR, AP, DI, RT, SU, MA, UT, LA,
DOC menu opt -- Display documentation PGM -- Display program names
QU -- Exit to previous menu
                                   EX -- Exit to UNIX
 Select desired menu option or program name ([CR] for menu):
```

Data Input Submenu (IN)

The user may select programs from the Data Input submenu (IN), to bring data into the ADAPS database for processing. Each program name is listed in the description. This menu is visible to access levels "USER" and higher.

Primary Data Processing Submenu (PR)

The user may select programs from the Primary Data Processing submenu (PR) to perform the actual data editing, validation, correction, and manipulations required to produce published data. This menu is visible to users at access levels "USER" and higher.

```
*********************
    US. GEOLOGICAL SURVEY AUTOMATED DATA PROCESSING SYSTEM (ADAPS)
(AP) SUB-MENU: ADAPS Statistical applications
       *******************
1 -- Daily-Values Monthly and Annual Statistics
2 -- Daily-Values Duration and N-day Low/High Value Analysis
3 -- Daily-Values Daily Summary Statistics
4 -- Daily-Values Tables
5 -- Daily-Values Inventory
FROM THE PREVIOUS MENU -- IN, PR, AP, DI, RT, SU, MA, UT, LA,
DOC menu opt -- Display documentation
                                 PGM -- Display program names
QU -- Exit to previous menu
                                 EX -- Exit to UNIX
Select desired menu option or program name ([CR] for menu):
```

Statistical Applications Submenu (AP)

The user may select programs from the Statistical Applications submenu to perform statistical analysis of processed daily-values data. This menu is visible to users at all access levels.

Data Display Submenu (DI)

The user may select programs from the Data Display submenu to view and print ADAPS tables, reports and other formats.

Data Retrieval Submenu (RT)

The user may select programs from the Data Retrieval submenu to retrieve data from ADAPS in various formats. The programs will allow the user to display or print the data, or to export data for use in other applications outside ADAPS. This menu is visible to users at all access levels.

Update Support Files/Record Submenu

The user may select programs from the Update Support Files/Record submenu to manage data aging, update sensor location information, update data descriptor information, update ADR instrument information, and to manage preferred input identification. This menu is visible only to users at access level "ADBA" and "SYST".

```
*******************
  US. GEOLOGICAL SURVEY AUTOMATED DATA PROCESSING SYSTEM (ADAPS)
  REVISION NWIS 4 2 0-20020402 Jun 04, 2002 12:40:44 Tuesday
                   (MA) SUB-MENU : Maintain Database
1 -- Manage Record Data Aging Status
2 -- Update DIS Node Configuration File
3 -- Review/Delete User File Entries
4 -- Archive Unit-Values to disk for tape storage
5 -- Restore Unit-Values from ARCHIVE files
6 -- Split a UV sub-file in two
7 -- Delete Measured Unit Values For SENTRY reload
FROM THE PREVIOUS MENU -- IN, PR, AP, DI, RT, SU, MA, UT, LA,
DOC menu opt -- Display documentation PGM -- Display program names
QU -- Exit to previous menu
                                     EX -- Exit to UNIX
Select desired menu option or program name ([CR] for menu):
```

Database Maintenance Submenu (MA)

The user may select programs from the Database Maintenance submenu to manage data aging, update database configurations and user information, archive and restore data, and manage the distribution of Unit Values into subfile tables for load balancing. This menu is visible only to users at access level "ADBA" and "SYST".

Miscellaneous Utilities Submenu (UT)

The user may select programs from the Miscellaneous Utilities submenu to perform a variety of tasks that are not directly involved in processing the data. The menu is visible to all users, but "COOP" users will see only the first option to handle ADAPS Groups. Users at access level "USER" and higher will see all options as shown here:

Local Applications Submenu (LA)

If the local Site Administrator has installed any local application programs, they will be listed in the Local Applications submenu. The default menu supplied with an ADAPS installation will appear as shown, and is visible to all users.

4.3 ADAPS Startup And Query Routines

This section explains the ADAPS startup routine and describes each of the available options. Explanations are presented for each of the query options.

All ADAPS programs use a common set of routines to provide an orderly and consistent method for startup of the system programs and for handling queries. This feature gives the programs a uniformity of processing. Every program initially calls the startup routine and then uses a common set of routines to handle the individual program-user queries. Since the capabilities that these routines provide are common to all programs, they are documented below and are not described in detail in the program-specific sections discussed later in the manual.

Startup Routines

All ADAPS programs call a startup routine that performs several functions. When an ADAPS program is initially invoked, the startup routine queries the user for certain information that relates to the specific program that is to be run. Data obtained by this action must be retained in a User File for that user. The startup operation also opens all of the needed INGRES tables. If the ADAPS program is to run later using a batch postprocessor program (an option in some programs), the startup routine also creates the initial records for a Control File for use by the postprocessor program. At times, there may be a need to edit the records in the control file manually; therefore, the Control File records are described in Chapter 6 at the end of the manual.

Upon subsequent entries into ADAPS, the startup routine retrieves and displays user choices from previous ADAPS invocations. The user makes any desired changes and continues with the processing in the routine. The information displayed varies from program to program, depending upon the needs of the individual program. An example of a complete user information display from the startup routine follows:

```
ADAPS TEST SITE
                       STARTUP TEST PROGRAM
DATE: 05-07-2001 USER JDOE
                                                        TIME: 08:55:19
*********************
CURRENT USER INFORMATION
PA - FILE PATH - <PART>JDOE>NWIS
OT - OUTPUT TO - OUTPUT TO A FILE
OT - BATCH OUTPUT - OUTPUT TO A FILE
OF - OUTPUT FILE - O.UV_TABLE.020.20010405.1323 <-- (See below)
OF - OUTPUT FILE - OUTPUT TO USER-SUPPLIED FILE NAME
TR - TAPE READER - MITRON
______
DB - DATABASE - ADAPS TEST DATABASE
AG - AGENCY - USGS GEOLOGICAL SURVEY
ST - STATION(S) - 12345678 TEST STATION
DD - DATA DESCR - INSTANTANEOUS GAGE HEIGHT IN FEET
IN - INSTRUMENT - ADR #1 TEST FOR ADAPS
SC - STATISTIC - 00003 MEAN
YR - PERIOD - 2000 TO 2001 Water Years
DT - DATES - 05-05-2001 TO 05-05-2001
BA - JOB MODE - BATCH MODE USING A TEMPORARY CONTROL FILE
BQ - BATCH QUEUE - NIGHT1
********************
Enter: PA,OT,OF,PL,PO,TR,DB,AG,ST,DA,DD,IN,SC,YR,DT,BA,BO,BF to
        edit field or [CR] to continue:
```

Display from Startup Routine

A brief discussion of each of the options (two letters) and user information items shown in this example is given in succeeding sections of the manual. Each section is titled with the option, followed by the information item as shown in the example. Remember that this display is not shown in its entirety in every program.

PA - FILE PATH Option

This option queries for the pathname of the directory where the user's output and temporary work files are to be placed. The pathname must be less than **96** characters long (to allow room for a file name to be appended). The user must have access rights to this directory.

OT - OUTPUT TO Option

This option queries for the output destination of a particular program's printed output. Choices are output to the user's terminal, a file, or a printer. The printers available may be attached to the user's terminal or the system. A list of the printers configured on the user's NWIS Host is displayed when the printer option is chosen.

OF - OUTPUT FILE Option

This option queries for the name of the file in which to place printed output if output to a file is selected via the OT option. The default is to place it in the named FILE PATH directory (see example in the startup screen above) that is part of the ADAPS startup. In ADAPS, an output file name is automatically generated with each invocation of a program. The form of the generated name is given below:

```
EXECUTION_CODE.PROGRAM_ID.USER_NUMBER.YYYYMMDD.HHMM

where EXECUTION_CODE = 0 for output, E for error file;
PROGRAM_ID = the name of the main ADAPS program being executed;
USER_NUMBER = an operating system assigned user number;
YYYYMMDD = execution date consisting of year;
month, and day,
HHMM = execution time of day in hours and minutes.
```

The name can be changed to any name the user wants, but it must be changed each time the program is invoked. The stored file name is overwritten (updated) with each new invocation of a program.

• TR - TAPE READER Option

This option queries for the desired type of digital tape reader. A list of readers configured on the NWIS Host is displayed if more than one reader is available.

• DB - DATABASE Option

This option queries for the name of the desired database. Most systems will have only one database, but the capability is available to have several. For example, some districts have configured a database specifically for use by a cooperator. A list of databases is displayed if more than one is available.

• AG - AGENCY Option

This option queries for the desired agency code. A list of available agency codes is displayed if the option is selected. Note that the existence of an agency in the list does not necessarily indicate the presence of data for that agency in the files.

ST - STATION(S) Option

This option queries for a single station identification number, or the name of an existing station/data descriptor group, or allows the user to build new groups and/or edit existing groups. Depending upon which program is to be run, groups may not be allowed.

• DD - DATA DESCRIPTOR Option

This option displays a list of available data descriptors for the selected station. If more than one is available, then one must be selected. If only one is available it is selected automatically.

• IN - INSTRUMENT Option

This option queries for an instrument and is applicable only for programs accessing ADR records. A list of available instruments for the selected station is displayed if more than one is available.

• SC - STATISTIC Option

This option queries for a daily values statistic code. A list of available statistic codes is displayed if it is selected to do so.

YR - PERIOD Option

This option queries for either a single year or a beginning and ending year that defines a computational or retrieval period. It also queries the user, if the program options allow, for a begin month with which to start the annual period. If a begin month of zero (0) or blank is selected, the years are standard water years. If any other month is selected (including 10), the years are years beginning with the month and year combination. For example, if begin month is 0, year 2001 is the 2001 Water Year. If begin month is 10, year 2001 is the start of the 2002 water year (i.e., year beginning October 2001).

• DT - DATES Option

This option queries for either a single date (month, day, year) or a beginning and ending date that defines a computational or retrieval period, depending upon the program.

BA - JOB MODE Option

This option queries for the job execution mode of programs that allow either interactive or batch processing. Interactive mode is actually the execution of a background process by the program, which pauses the user's terminal until the phantom logs out. Therefore, interactive mode should only be used for short jobs. Selection of batch mode causes the program to be submitted to a user-selected batch queue for execution. If batch mode is selected, the user is queried for a queue name. A list of queue names available on the user's NWIS Host is displayed. When this option (BA) is selected, the startup routine builds a control file containing data obtained from the user and/or data retrieved from the User File. This control file will ultimately provide needed data to the program that will run in the batch environment.

BQ - BATCH QUEUE Option

This option allows the modification of the user-selected batch queue.

Query Routines

User interaction in ADAPS programs is handled by a set of query routines that use common commands. Since these commands are common to all queries, they are usually not repeated when the prompts are displayed. In addition to the answer to a prompt, most queries can be answered with the following partial or full word:

For HELP: HE, HEL, or HELP. For OOPS: OO, OOP, or OOPS.

For QUIT: QU or QUIT.

For EXIT: EX or EXIT.

Each of these answers (the associated routine), and an additional command to execute a UNIX command from within an ADAPS program, are discussed below.

HELP Routine

The HELP answer displays a short message giving further information about appropriate responses to queries. If no help is available for the query, the message "Sorry, no help available" is displayed.

OOPS Routine

The OOPS answer, in many cases, returns the user to either the previous query, or to some other query that was previously displayed, thus allowing the user to reanswer a prompt if there is an erroneous response. If backing up from the current query is not possible, the message "Sorry, OOPS is not available" is displayed.

QUIT Routine

The QUIT answer immediately ends program execution, possibly leaving edited data unsaved, and returns the user to the menu that invoked the program.

EXIT Routine

The EXIT answer immediately ends program execution, possibly leaving edited data unsaved, and returns the user to UNIX level.

Execute a UNIX Command Routine

An additional query routine provides for execution of a UNIX command from within an ADAPS program. The command is formed by an exclamation point <u>and a space</u> (!) followed by the UNIX command and its options (up to 160 characters long). Entry of "! Command," where Command is the UNIX command and any of its options, causes the command to execute. When the command invocation is complete, the query routine redisplays the prompt for an answer.

4.4 Data Input

This section presents the programs which may be used to bring water data into ADAPS from a variety of sources and methods. Data may be unit values, daily values, measurements (discharge measurements, site inspections, groundwater calibration levels, etc.), and card-image data from other sources.

PROGRAM NAME	TASK DESCRIPTION	SECTION
TP_READ	Read in ADR Tape data	4.4.1
CD_READ	Read in ADR card-image data	4.4.2
TP_EDIT	Edit and store ADR Tape data	4.4.3
DRFILES	Review/delete digital tape temporary files	4.4.4
UV_STORE	Converts unit-values card-image data files into Standard Format files	4.4.5
UV_ENTER	Manually enter Unit-values data using Keyboard/Digitizer	
DV_STORE	Read in daily-values card-image data	4.4.7
STD_STOR	Read in WRD Standard Format input data	4.4.8
MS_EDIT	Update/display measurements	4.4.9

These programs allow users to bring in data from a variety of sources and store it into ADAPS. These are generally used for non-real time data sources or to provide backup data (for example, downloading the data from a DCP and reading it into the database under a separate transport code to serve as a backup for the real-time satellite transmissions of the same data). Users may bring in data from an electronic data logger (EDL), digital recorder (ADR) paper tapes, from card-image data files stored on disk in several different formats, or from digitized strip charts, or even keyboard entry. The data can subsequently be edited for correctness and stored into the database for further processing. Also, users may enter, update, and display discharge measurements, site inspection data, groundwater measurements, and other types of information, to be used in developing and calibrating the automated processing handling of water data within ADAPS.

4.4.1 Read ADR Tape Data (TP_READ)

The TP_READ program is used to translate, or read into ADAPS, data from ADR digital paper tapes. The program first checks to see if there are any tape readers defined in the ADAPS installation. If there are none, the user is informed and the program stops. If there are tape readers configured, the program will check for (and prompt the user if necessary) the Agency, Site, and Instrument. Next, a list of the files located in the temporary directory is shown, and a request is made to take appropriate action.

The user is queried for the start and end dates and times of the record to be read from the tapes. Up to 20,000 punch values can be translated from one tape. During the translation, the tape reader will stop on a punch value of zero. A number of default missing values may be inserted or processing can be terminated. At the end of each translation, the user

has the option to: translate another tape, switch to the display of User File entries to change sites, or exit the program.

4.4.2 Process ADR Card-Image Data (CD_READ)

The CD_READ program is used to read files of unit value data that are in the format of 80-column ADR cards. The data from these card images are translated and stored into a temporary tape file. The temporary file of ADR card-image data can then be time-checked, screened, and verified by using the TP_EDIT program, which will store the Unit Values into the measured unit values table in the ADAPS database. Once the data from the ADR card images have been stored in ADAPS and the temporary files are no longer needed, the temporary files may be reviewed and deleted using the **drfiles** program.

ADR Data Format

The unit value data processed in CD_READ is in 80-column ADR card images, as described below. Each data file consists of one header record followed by data records.

Header Record Format

Columns	Description of field	
1 - 3	Readings per day (002, 004, 006, 008, 012, 024, 048, 096, 144, 240*, 288, 440**)	
	* 240 valid only for tide records ** coding of 440 represents 1440 readings per day (1 minute punch interval)	
4 - 11	Rightmost 8 digits of the Station ID number. If latitude/longitude is used for the station number, use the lower 2 digits of longitude degrees, the 2 digits of longitude minutes, the 2 digits of longitude seconds, and the 2 digit sequence number.	
12	Number of items (channels) per punch interval. For QW monitor 10-channel data, use 0 (zero), otherwise use actual number of QW monitor channels.	
	For multiple-channel gate-opening data, this value is the first digit of a 2-digit number.	
13 - 18	Starting Date of the tape (YYMMDD) - Calendar year	
19 - 22	Starting time of the tape (HHMM) - Use local Standard time regardless of time shifts during summer months.	

Header Record Format (Continued)

Columns	Description of field	
23	Record type code	
	0 = Stage record on a separate recorder tape	
	1 = For slope stations, this record is for the base gage not followed by a corresponding record for the auxiliary gage, or stage and deflection record as sets of readings on the same recorder tape with the stage record the first of the two items/channels	
	2 = Stage and deflection record as sets of readings on the same recorder tape with the deflection record the first of the two items	
	3 = Digital monitor record	
24 - 29	Ending date of the tape (YYMMDD) - Calendar year	
30 - 33	Ending time of the tape (HHMM)	
34	This is the second digit of a 2-digit number indicating the number of items (channels) on the tape for multiple-gate opening data. If not used for this type data, it is 0 (zero).	
35 - 40	Ending Watch date of the tape (YYMMDD) - Calendar year	
41 - 44	Ending watch time of the tape (HHMM)	
45 - 72	Blank	
73 - 80	Optional sequence number. Blank if not used.	

Data Record Format

Columns	Description of field
1 - 72	Punch readings (values) - Up to 18 4-digit numbers, right-justified with leading zeroes. All records except the last will be packed to a full 18 values, the last record may have fewer than 18 values and is blank-filled to column 72.
73 - 80	Optional sequence number. Blank if not used.

Sample Data File

The following sample data file contains hourly data (24 readings per day) from station 04095101, one channel, starting on 2002/06/03 at 1100 local and ending on 2002/08/19 1100 local, with a watch time of 2002/08/19. The fields in the header record are shown in alternating colors to distinguish the fields more easily.

4.4.3 Edit and Store Translated Data (TP_EDIT)

The TP_EDIT program is used to edit, screen, and store ADR unit-values data translated from paper tapes. Editing tests available are described.

The temporary files created by use of either program described previously (TP_READ, CD_READ), are processed by this program. Once the startup routine is completed, the user can view, edit, time correct, verify, print the data, and store the data into the ADAPS database. The Unit Values are stored as type "measured" with a transport code of "ADR". If the DD was set up with the ADR as Preferred Input, then the unit-values will also be copied into the "edited" unit values tables. Up to 20,000 values, including time corrections, can be processed in the edit/store operation.

There are nine options available in the program. A list of these options is as follows:

- 1 Time-adjust test
- 2 Verification test
- 3 Edit punch values
- 4 Print punch values
- 5 Create ADR cards
- 6 Store unit values
- 7 Restart program
- 98 Exit to ADAPS main menu level
- 99 Exit to UNIX level

Brief descriptions of the first seven options are presented in the following sections in the order listed above

Time-Adjust Test

This option is used to compute the date-time tag for the last value in the input data set and to compare it to the ending watch time entered when the data were translated. If the two times are different, the recorded times are corrected to ensure that timing of the data values is correct.

Time corrections can be done in two ways. The first is called the standard time correction, and the second is the historical time correction. Each is discussed separately.

The standard time correction uses the actual elapsed watch time of the record and the number of values contained in the record. This method computes the real elapsed time per data value, and corrects the date-time tags stored with each data value. No data values are added or deleted from the record. Use of this method does not affect the original recorded values; therefore the user can readily recompute if it is necessary to do so.

The historical time correction adds or removes data values from the record to maintain a fixed time interval between readings and still have the data record end at the correct date and time.

Verification Test

The verification test option is used to check the data record for extreme, unusual, and error conditions. The testing process presently tests three cases and uses verification thresholds that are stored in the ADR Instrument record. Stored test threshold values are displayed and may be changed prior to the actual testing. Values that fail the threshold tests are flagged and can be highlighted during the editing process. The cases and the type of failure conditions that may cause a value to be flagged are given below. An abbreviation for the condition is shown in parenthesis after the condition. The abbreviation may appear (vertically) in some of the screen displays.

1. For a single reading:

- □ Very high value (VHI).
- □ High value (HI).
- □ Low value (LO).
- □ Very low value (VLO).

2. For the difference from the previous reading:

□ Test difference (DIF).

3. For the rate of change from the previous to the current reading:

- □ Very rapid increase (VRI).
- □ Rapid increase (RI).

- □ Rapid decrease (RD).
- □ Very rapid decrease (VRD).

Note that for items 2 and 3, test values must be stored (in the ADR Instrument record) in the proper units for the kind of data being tested. For item 2, the test difference is units per reading or per punch.

Edit Punch Values

This option is used to add, change, or delete punch data values. The option is useful for viewing the data and changes should be made with discretion.

The edit option displays 15 sets of values with the current set that is being edited centered on the screen. A set of values consists of the readings for all of the channels (sensors) for a given date and time. Editing is performed by entering a single option character followed by a carriage return (shown as **<cr>** or just a carriage return). If required by the selected option, the user enters the necessary startup information. The available options, their meanings, and the subsequent actions taken by each of them are given below:

```
<cr>
           - Next screen
                              - Displays the next 15 sets
 Ρ
           - Previous screen - Displays the previous 15 sets
 Т
           - Top of file
                              - Displays the first 15 sets
           - Bottom of file - Displays the last 15 sets
 В
           - Go to set
                              - Displays the selected set centered
 G
           - Change punch
                               - Replaces the selected reading with the
                                user-supplied value
                              - Inserts a user-supplied value
 Ι
           - Insert punch
 D
           - Delete punch
                              - Deletes the selected value
           - Change digit
                               - Replaces a selected digit in a range
                                 of values with a user-supplied digit
           - Add constant
                               - Adds constant (+ or -) to a set of
                                 values
            - Set highlight
                               - Highlights values that exceed
 R
                                 screening thresholds
            - Next highlight
                               - Centers next highlighted value in
                                 editing screen
  \mathbf{z}
                               - Exits this option
           - Done editing
```

Print Punch Values

This option is used to print a table of punch-data values, the times, and the verification test results for selected data values.

Create ADR Cards

This option is used to write the unit-values data to a disk file in ADR card-image format rather than storing the data into ADAPS. This is intended to allow transfer to other computers or applications.

Store Unit Values

This option is used to store the data into the ADAPS Unit Values tables. Data cannot be stored unless they have first been time-adjusted and verified. If there is existing ADR unit values data in ADAPS which has been set to "In-Review" or "Approved", the data will not be stored, because the existing data is protected from being overwritten. If the new data are needed, the user must have the existing data set back to "Working" status and then store the ADR data.

Restart Program

This option is used to return the user to the initial startup level. This allows for making changes in startup options to process another digital tape without having to restart the program from scratch.

4.4.4 Review/Delete Digital Tape Temporary Files (DRFILES)

The **drfiles** program displays a list of the available temporary files created by the TP_READ or CD_READ programs in the process of translating or processing new ADR data for the user-selected agency, station, and instrument. The user is given the option to delete any temporary files that are no longer needed.

4.4.5 Process UV Card-Image Data (UV_STORE)

The UV_STORE program is used to import unit-values data into ADAPS from data files using card images in the old Watstore B-Cards format. Previous versions of this program stored the data directly into the ADAPS Unit Values tables. The program has been revised for NWIS 4.2 and now serves as a filter to convert data files in the B-Cards format into WRD Standard-Format data files. The data files are then stored into ADAPS using the program STD_STOR in a separate processing step. This section explains the options and how the program runs.

The unit values stored within ADAPS may be retrieved and stored into data files in cardimage format. Data files of unit values may also be produced in other computer programs and applications which process data (from recording devices such as digital punch recorders) into a format which can be used as input to ADAPS. These files may then be processed using the UV_STORE program as the initial step in getting the unit values stored into ADAPS. The data files contain card images in the old Watstore B-cards format described below. Previous versions of the UV_STORE program processed the data and stored it directly into ADAPS. With the release of NWIS 4.2, the program

has been modified to act as a filter or conversion module which will read the input Watstore card images and create an output data file in the current WRD Standard Format (see Section 6.3). The user will then be required to run the STD_STOR program to store the unit values data into the ADAPS database. The UV_STORE program does not store the data into the database because it is intended to serve as a transition to the use of the more modern and more capable Standard Format rather than an old data format which has been superseded and is obsolete. The data file created as the output from UV_STORE may be retained by the user and used for future data inputs into ADAPS, eliminating the need to run UV_STORE again.

The data files to be processed by UV_STORE must contain 80-column card images in the Watstore Type-2 and Type-B data format. The type-2 card (record) contains the card type ("2"), the station identifier (ID), parameter code, and statistic code. The type-B card contains the card type ("B"), the date/time (YYYYMMDDHHMMSS) of the first unit-values reading on the card, the number of readings per day (rpd), and the data (up to six values per card). The data file may contain optional Type-Z cards, which allow the user to specify an agency code other than the default value set in the ADAPS startup routines. Other types of card images may be present but are ignored. The program processes multiple stations and parameter codes.

The agency code defaults to whatever is set in the ADAPS start-up menu. However, the agency code is replaced by the agency code from a type-Z card (record) if one is found in the data file.

Program Operation

This interactive program goes through the standard ADAPS startup routine after presenting a warning that the data file will be converted to a new format, not stored into the database as in previous versions of the program. It will then prompt the user for the names of the input unit-values card file and the output file for the converted card images. The input file name is the name of the file that contains the type-2 and type-B card unit values data. This file must already exist or the software will display an error when attempting to open it. The output file name is the name of the file to which the card images will be written in the format specified for STD_STOR. If the output file does not exist, it will be created. If it does exist already, the user will be asked if he or she wants to overwrite the existing data. When the file names have been entered and the files opened, the user will be prompted for several further options. These options are discussed below.

Option 1 is the Type of Unit Values to store. The user must select the type of data being processed for storage into the ADAPS database.

The available choices are:

1. Measured Unit Values: This option is the default. These data are to be stored as the actual measurements from a recording device.

2. Computed Unit Values: These data have been previously computed or processed such as discharge, rainfall, and in some instances stages (with or without decimal points, depending on whether they are dial or real values). See NOTE after Option 4 at the end of this section.

Option 2 is the Data Conversion Flag to be used. The user has the choice to perform no conversion, multiply each Unit Value by 100, or to multiply each UV by 0.01. The default is no conversion.

The user must be aware of how the use of the conversion flag may affect the results of any computations involving the unit values. The UV_STORE program merely takes the specified flag and applies the multiplication to each UV read from an input card before storing the result into an output card image.

Option 3 is the Transport Method to attach to the data. This option allows the user to specify the source of the unit values data, which is stored into the ADAPS database along with the data itself. There is no default value, the user must select from the list below:

- 1. None ('UNS' unspecified) -- This option does not specify a source.
- 2. 'ADR' -- This data originated from an ADR paper tape recorder.
- 3. 'DCP' -- This data was transmitted by DCP through satellite relay operations.
- 4. 'EDL' -- This data was recorded by an Electronic Data Logger unit.
- 5. 'OBS' -- This data originated from Field Observations.

Option 4 is the Time Zone code (the "time datum") to apply to the data. This code determines how the time-stamp for each Unit Value will be processed when the data is stored into the ADAPS database by STD_STOR. The default value for this option is "Local". The user is first prompted to answer "Yes" if wanting to use the default code, or "No" if wanting to specify a time datum for the data. If the answer is "No", the user is prompted to enter the time datum to apply to the data (for example, "MST" for Mountain Standard Time).

Once all options have been specified, the UV_STORE program will begin processing the input file. Each time there is a change in the input station ID or parameter code during processing (signaled by use of a type-2 card in the data file), the program pauses and prompts for a new data descriptor (DD) selection; therefore, there must be DDs for all data that are to be processed. After the DD selection is made, the program continues to process the card data for the new station. If the station changes in the data file without finding a type-2 card, the program will close the output file with all valid data processed so far, and will display an error message to warn the user to correct the data file. During processing, the program displays the station and parameter. When processing of all cards in the input file is finished, the program summarizes the processing by listing the counts of total input cards of each type that have been processed. If any errors are encountered during processing, an entry is made to an error file and the user is given the information and the name of the file. This error file, named "UVS.ERRORS" resides in the directory the user specified in the Path command in the ADAPS startup menus.

Once the UV_STORE program has completed processing, the user must load the reformatted data file into the ADAPS database using the program STD_STOR, which can be found in the IN Input menu as Option 8 (for the default menus supplied with NWIS).

WATSTORE Card Formats Used

This section describes the formats of the old WATSTORE card formats which are used by the UV_STORE program. Other programs may use these formats to produce output data files for input to ADAPS, or other ADAPS programs may be used to create data in this format (notably OUTWAT). Data input and output using the WATSTORE cards formats provides backward compatability to existing programs outside NWIS.

Z-card format

This card format is used to identify the Agency code for the station. Most ADAPS programs use "USGS" as the default value for the agency code. The Z-card is used when the agency code must be set to some other value. It is an optional input to UV_STORE.

Columns 1	Variable Name Record Type	Contents "Z"
2 - 32	(reserved)	blank
33 - 37	Agency Code	5-character agency code (i.e. "USGS")
38-80	(reserved)	blank

2-card format

This card format is used in UV_STORE to identify the station and specific type of data (by parameter and statistic codes) for unit values data. The ADAPS program **outwat**, or other programs outside of ADAPS, may be used to create these records as output.

Columns	Variable Name	Contents
1	Record Type	\\2''
2 - 16	Station Identifier	15-digit station number
17 - 22 left bank	Cross Section Location	The distance in feet from
		(as determined by facing downstream). Blank indicates that the location was not stored.
23 - 28 from water	Depth Locator	Sampling Depth, in feet,
220311 110002		surface. Blank indicates the field was not stored, "111111" indicates top samples, "888888" indicates bottom samples.
29 - 33	Parameter Code	5-digit parameter code
34 - 38	Statistic Code	5-digit statistics code
39 - 54	(reserved)	blank
55 - 57	Operation Code	UV processing: Leave blank.
58 - 80	(reserved)	blank

B-card format

The ADAPS program OUTWAT may be used to retrieve Unit Values data from NWIS and create records in the B-Card format. Other programs outside of ADAPS may also be used to create files of Unit Values data in this format, which can be loaded into NWIS databases using the UV_STORE program. Generally, one Type-2 card and a series of Type-B cards are created for each time-series retrieved. The contents and format of Type-2 cards are described above. Unit-values are sometimes stored in ADAPS at unequal time intervals due to time corrections or missing data. The contents and format of Type-B cards (80 bytes each) are described below:

Columns	Variable Name Record Type	Contents "B"
	Station Identifier	15-digit station number
	Date:	
17 - 20	Calendar Year	YYYY
21 - 22	Month Number	01 - 12
23 - 24	Day Number	01 - 31
	Time of First Reading (00:00	:00 - 23:59:59)
25 - 26	Hour (24-hour clock)	00 - 23
27 - 28	Minutes	00 - 59
29 - 30	Seconds	00 - 59
31 - 35	Number of Readings per Day	(1440 Maximum)
36 - 38	(reserved)	blank
39 - 80	Unit Values	(a) up to 6 Unit Values
1		

(a) Unit values. Six 7-column fields that contain the unit values for successive time increments for the designated date and starting time. Time increments are not specified, instead they are computed based upon the starting time and the Readings per Day value. Blank fields indicate no data are available for that day and time.

4.4.6 Enter Unit Values from a Digitizer (UV_ENTER)

The UV_ENTER program is used to enter unit values manually, from a terminal, or by using a digitizer. The program may also be used to review or modify existing unit values, but use of the HYDRA (TS_EDIT) programs is recommended instead, as the UV_ENTER software will be phased out in a future release of NWIS. Note that the daily values calculated from the associated unit values are not automatically updated, but the user may perform the recalculation as an option.

Specify Default Values

There are two codes stored with each day of unit values:

- 1. Transmit status status of transmission
- 2. Data status whether data are PROVISIONAL (stored as "Working") or FINAL (stored as "Approved")

Also, there are two codes stored with each unit value:

- 1. Write-protect = protection status for unit value
- 2. Rounding = special rounding to be used for value

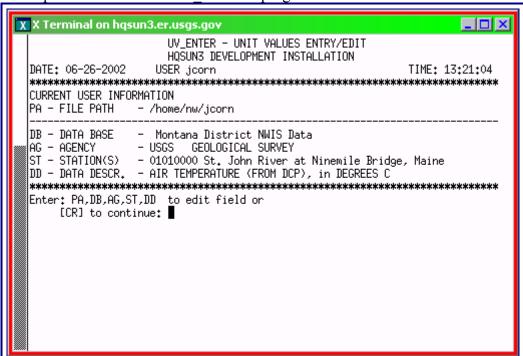
There are default values for these codes which, unless overridden, are stored with new days and new unit values created during a session. At the start of the program the user may review and/or change these default values. By specifying the codes on a day-by-day or value-by-value basis during processing, the user can override the default values. The preliminary startup of the program allows the user to set the station, DD, and output specifications for the program, then asks if the user wants to change the default values for the session:

```
Do you wish to change any defaults for the session [Y/N DEFAULT=N]:
```

It is normally not necessary to change the default values. After this query is answered, the ADAPS startup screen is displayed again.

Select Station/Data Descriptor

After the defaults that will apply for the entire session are specified, the normal ADAPS startup allows selecting a station and a data descriptor for which to enter data. Following is an example screen from the UV ENTER program:



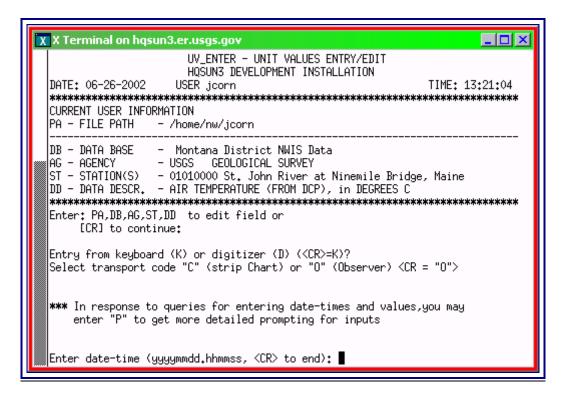
Select Keyboard/Digitizer Entry

After the user selects a station and a data descriptor (DD), the program asks if unit values will be entered from the terminal or by using a digitizer:

```
Entry from keyboard (K) or digitizer (D), (<CR>=K)?
```

If a return only or a K is entered, processing continues as discussed in Keyboard Entry below. If a D is entered, processing continues as discussed in Digitizer Entry.

Keyboard Entry



After the user selects a station and a data descriptor (DD), the program prompts for the desired Transport Code to assign to the Unit Values being entered. Options are "C" (digitized strip Charts) or "O" (Observer). The default is "O". Once the Transport Code has been specified, the program will prompt the user for a specific date-time, and then a value for that date-time. The available options for automatically entering date-time sets and/or values are available and discussed in the following two sections.

Date-Time Entry

The prompt for entering the date-time associated with a unit value is the following:

```
Enter date-time (yyyymmdd.hhmmss, <CR> to end):
```

The date-time entry is entered as year-month-day-hour-minute-second in the following form:

yyyymmdd.hhmmss

If entering many values, it would be very tedious to enter all 15 characters for every date-time entered. Therefore, the program requires entering only that portion of the date that has changed from the previous date, and only that portion of the time that is not zero (00). Enter at least the day (dd) on the first entry, although the year (yyyy) and the month (mm) will default to the current year and month. An even number of digits must be entered; that is, complete components for yyyy, mm, dd, hh, mm and ss. Following are a few examples of date-time entries:

AS-ENTERED INTERPRETATION

850701	19850701.000003		
02.01	19850702.010000		
.1230	19850702.123000	(If no date, the "."	must be entered.)
.16	19850702.160000	`	,

Several options may be entered along with a date-time. These options may be used to automatically generate date-times and/or may be used to override the transmit-status or data-status codes for the date in question. Enter the options by following the date-time value by one or more entries of the form @=xxx, where @ is an option code and xxx is the value to be used with the option. The valid option codes and xxx values are explained in the next section. Note that the date-time and the options must be separated by one or more spaces.

If the response to this query is "P," individual prompts with detailed individual helps are available for each option.

Date-Time Entry Options

This section describes the valid option codes and xxx values mentioned in the previous section. The @ is at the left of the equal (=) sign, and the xxx values to the right. For the M, X, and D option codes, the xxx values are selected from an additional group of options.

<u>I=dd.hhmmss</u>. This option indicates that the date-time entered is to be automatically incremented by the specified days, hours, minutes and seconds. Similar to the date-time entry, the days need not be entered if they are zero (00), and the hours, minutes or seconds need not be entered if they are zero. For example, if I=.01 is entered, that would specify that the date-time be automatically incremented by one hour. If the user chooses this option, he or she will not be prompted to again enter date-time until the generated date-time exceeds the ending date-time (see E=yyyymmdd.hhmmss below) or until a null (return only) value is entered.

<u>I=D</u>. This option specifies that the date-time generated is to alternate between the first possible time of day (000000) and the last possible time of day (235959).

<u>I=N</u>. This option is similar to the I=dd.hhmmss option except that the date-time generated is the date-time of the next already existing unit value. This option is used when replacing or deleting existing data.

E=yyyymmdd.hhmmss. This option is used to specify an ending date-time and to terminate the automatic generating of date-time sets at the specified date-time. Similar to the initial date-time entry, the user need not enter those elements of the date which are the same as the date entered for the initial date-time, and the user need not enter the elements of time which are zero (00).

<u>M=m</u>. This option is used to specify how preexisting data are handled when new data are created. For m, enter one of the following:

- \mathbf{D} Display only, no data to be entered.
- <u>I</u> Insert. Any existing data will be preserved. New data will be added only for new date-time sets.
- <u>M</u> Merge new data with existing data ignoring any existing data. If the date-time of new data is identical to the date-time of existing data, the new data will replace existing data. This option must be used when manipulating existing data.
- <u>N</u> Notify user if any data already exist in the time specified. An opportunity will be provided to review the data and then to bypass storing of the data. If the user elects to continue, data will be merged as if the M option were selected. This is the default.
- **R** Replace all existing data in the time specified. The user will be advised if any data exist before the start time in the start day, or if any data exist after the end time in the end day.
- $\underline{X}=\underline{x}$. This option sets the transmit status code for the current date. For x, enter one of the following:
 - <u>Y</u> Ready to send.
 - N Not ready to send. This is the default.
 - **S** Sent.
 - **K** Data OK, but do not send.
- <u>**D**=d</u>. This option sets the data status code for the current date. For d, enter one of the following:
 - <u>P</u> Provisional. Note: The status code cannot be changed from F to P for previously existing data by using this program. P is the default for this option.
 - **F** Final.

For example, the following response to the date-time prompt:

850701.01 I=.01 E=02.24 M=R specifies that times be generated each hour from 01:00 on 7-1-85, through 24:00 on 7-2-85. Any existing data in this time span are deleted.

Value Entry

The prompt for entering the value part of a unit value is:

Enter value for YYYY-MM-DD HH:MM:SS or <CR> for new date-time:

Values are entered using one of four forms:

- <u>nnn</u> Store the number, nnn, for the current date-time. The number consists of 1-10 digits with or without a decimal point or sign.
- **D** Delete the value at the current date-time.
- **a**+nnn Add nnn to the existing value.
- <u>@*nnn</u> Multiply the existing value by nnn.

Enter the values as a number with or without a decimal point. As with the date-time entry, there are several options that may be coded with a value. These options are explained in the next section.

If the user responds to this query with "P", individual prompts and detailed individual "helps" are available for each option.

Value Entry Options

This section describes the valid options (left of = sign) and their values (right of = sign) for processing.

- <u>C=c</u>. This option specifies that the value be used c times, where c is any number greater than zero. The user will not be prompted to enter a value again until the current value has been used c times.
- <u>C=E</u>. This option is similar to the C=c option except that the value specified is used until the ending date-time (see E=xxx above) is exceeded.
- <u>E=e</u>. This option specifies to use the unit value (a number) that corresponds with the ending date-time (see E= yyyymmdd.hhmmss above), and further specifies that interpolation be done between the starting and ending date-time. The number of values calculated is determined by either the date-time increment (see I=dd.hhmmss above) or by the value count (C=c).
- <u>W=w</u>. This option specifies that the write-protect code (listed below) be stored with the current value. Note that this program will not override a write-protect code of "1" with a previously existing value. For w, enter one of the following write-protect codes:
 - **0** Not used.
 - <u>1</u> Write-protected.
 - **E** Estimated.
 - <u><</u>- Less than.
 - > Greater than.

- R=r. This option specifies that the rounding code be stored with the current numeric value. This code specifies the number of significant digits available and must be entered as 0,1,..9. This code is only used when the user needs to override the default rounding for the parameter in question. For example, the following response to the value prompt:
- <u>100 C=E</u> specifies that the value 100 be stored in all the date-time sets generated from the date-time prompt.

Keyboard Entry Sequence of Processing

Keyboard sequential processing continues with entry or generation of a date-time, followed by entry or generation of a value for one of the following situations:

- Entry of a date-time followed by entry of a unit value. This process continues until a null date-time (return only) is entered, or until an automatic generation of date-time or value is specified.
- Entry of a date-time followed by generation of a unit value. This continues until a null date-time is entered, or until the value count is completed.
- Generation of a date-time followed by entry of a unit value. This continues until the ending date-time is exceeded, or until a null unit value is entered.
- Generation of a date-time followed by generation of a value. This continues until the ending date-time is exceeded or until the value count is completed.

Digitizer Entry

The following discussion pertains to using a digitizer with a 15-key control where the keys 1, C, D, E, and F have been defined to have specific functions. The characteristics of the digitizers available at a site are defined in the file named /usr/opt/nwis/data/auxdata/digitizer.def. This file is described later in this section. Some of the dialog in this section will vary if the digitized data are read from a file, or if the digitizer uses different codes or has no code capability. These situations are also discussed next in the next sections.

First, position the chart on the digitizer. It is not necessary to place the chart parallel with the edge of the digitizer. The program adjusts the recorded values as necessary. The program starts with the following messages:

PREPARE CHART FOR DIGITIZING

TO CANCEL DIGITIZING AT ANY TIME DIGITIZE ANY POINT WITH C KEY DEFINE LOWER LEFT CORNER OF CHART -- SET POINTER TO A KNOWN LOW VALUE AT START DATE-TIME DIGITIZE POINT.

Position the digitizer pointer to a point at the lower left of the area of the chart to be digitized. This point must be at a known date-time and at a known value. Digitize the point. The digitizing process may be restarted at any time by pressing the C button on the

digitizer keypad. After digitizing this point, the prompt to enter the date-time associated with the point is displayed as follows:

```
Enter start date-time (yyyymmdd.hhmmss):
```

Enter the date-time in the form: yyyymmdd.hhmmss. However, it is not necessary that all 15 characters be keyed for each entry. After the first time, enter only that portion of the date (yyyymmdd) that changed from the last entry. If the year has not changed from the previous entry, enter only the month (mm) and day (dd). If the month also has not

changed, enter only the day. If the entire date (yyyymmdd) has not changed, enter only the time (.hhmmss). It is not necessary to enter the seconds (ss) if seconds are 00, or minutes if minutes are 00.

After entering the start date-time, enter the chart value associated with that date-time:

Enter value at (YYYYMMDD.HHMMSS), where YYYYMMDD.HHMMSS is the date-time entered above.

After the lower left corner has been digitized and defined, digitize the upper left corner:

```
DEFINE UPPER LEFT CORNER OF CHART --
SET POINTER TO A KNOWN HIGH VALUE AT START DATE-TIME DIGITIZE POINT.
```

This point must be at the date-time previously digitized and at a known chart value. After digitizing the point, enter the associated value:

Enter value:

After setting up the lower left and upper left corners of the chart, set up the lower right corner:

```
DEFINE LOWER RIGHT CORNER OF CHART --
SET POINTER TO CHART VALUE ***.** AT END DATE-TIME DIGITIZE POINT.
```

This point must be at the same vertical chart value as recorded for the lower left corner. Since the chart value is already known, the user is prompted only for the ending date-time:

```
Enter chart ending date-time (yyyymmdd.hhmmss):
```

Note that unentered portions of the date-time will default as discussed above. At this time, three points were specified that should define a right triangle. The program provides an indicator of the quality of the setup:

```
DEVIATION FROM RIGHT ANGLE IS: xx.x DEGREES
```

The user is also notified of the scaling, as defined by the following setup:

```
X-SCALE: xx.xxxxxx (dd.hhmmss) PER INCH
Y-SCALE: xx.xx UNITS PER INCH
```

After the chart layout is complete, the chart is ready for digitizing:

```
DIGITIZE CHART TRACE
DIGITIZE ANY POINT WITH KEY D TO DELETE PREVIOUS POINT - MAY REPEAT
DIGITIZE ANY POINT WITH KEY E TO INDICATE REVERSAL AFTER PREVIOUS POINT
DIGITIZE ANY POINT WITH KEY F WHEN FINISHED
```

Each point for digitizing must be entered with the 1 button. To delete one or more of the previously entered points, press the D button once for each point to be deleted. If the chart trace contains a reversal, digitize any point with the E button; the previous point is interpreted as a point of reversal. The next point digitized is the first point after the reversal. After entering the last point, press the F button. Points need not be digitized in any particular order.

After completing the digitizing, the following prompt is an opportunity to reposition the chart and continue digitizing:

```
Any more data to digitize?
```

If YES, processing continues with positioning of the chart, defining chart corners, and digitizing. After all digitizing is complete, data corrections may be applied. Due to mechanical problems with the recorder, paper swelling/shrinkage, etc., the end date-time and/or value as recorded may not agree with the actual values. A prompt to enter the true date-time of the latest-occurring point digitized is displayed:

```
Enter true (watch) date-time of latest point
  (<CR>=YYYYMMDD.HHMMSS):
```

The default date-time will be the date-time as calculated by the program, based on the digitized point and the chart setup. If entering a different date-time, a time correction is applied to all the digitized points. A prompt to specify the true value corresponding with the true ending date-time is also displayed:

```
Enter true value of last point entered (<CR>=xxxxxx):
```

where the default value is the value as calculated by the program. The data digitized are then stored in the ADAPS unit-values file.

If any data already exist in the unit-values file for the time span digitized, the user is notified and prompted to specify an option for merging the newly digitized data with the existing data. See the M=m paragraph of Date-Time Entry Options for more information about the available merge options.

Digitized Data From A File

If the digitizer selected is defined such that data are loaded from a file, the file must be formatted as follows:

- Record 1: X,Y values of lower left corner of chart
- Record 2: X,Y values of upper left corner of chart
- Record 3: X,Y values of lower right corner of chart
- Record 4-n+3: X,Y values of trace (n points). If any reversals, each must be indicated with one extra line to indicate the point of the reversal(s).
- Last record: String with code indicating digitizing is complete.

When prompted, enter the name of the file containing the above information. The file must be formatted as defined in the **digitizer.def** file, described next. The dialog is similar to that above except that there are no prompts for digitizing, only for entering date-time sets and values for corners.

Digitizers Without Code Capability

If the digitizer does not have a code-key capability, the dialog is similar to that mentioned above, except that codes are indicated by digitizing a point outside the region defined. To indicate cancellation of set-up, digitize a point to the left of the start date-time. To indicate deletion of a point, digitize a point below the value recorded for the lower left/lower right corners. To indicate a reversal, digitize a point above the value recorded for the upper left corner. To indicate that digitizing is complete, digitize a point to the right of the end date-time.

<u>Description of Digitizer Definition File</u>

The digitizers(s) available at a site are defined in a file named **digitizer.def**, which is stored in the /usr/opt/nwis/data/auxdata directory. The following is a sample listing of this file, which is self-documenting.

File: 'DIGITIZER.DEF' - DEFINE DIGITIZER(S) AVAILABLE AT SITE FOR ADAPS

Note: Retain the first 23 lines of this file - line 24 is first user entry. Enter one line of the following format for each digitizer available:

	_	
COLUMNS DESCRIPTION		
1-2 ID number for digitizer (01,02,)		
5-6 AMLC# (dec) if assigned line, 00 if terminal line,		
-1 if from file		
10-11 Total length of transmitted string, characters		
15-16 Character position of start of X-value in transmitted		
string		
19-20 Length of X-value, characters		
23 Number of decimal places in X-value		
28-29 Character position of start of Y-value in transmitted		
string		
32-33 Length of Y-value, characters		
36 Number of decimal places in Y-value		
40-41 Position of 1-character code in transmitted string		
(00 if no code)		
44 Code transmitted with digitized X,Y value (blank if none)		
45-48 Special codes: Cancel (45), Delete (46), Reversal (47),		
Finished (48)		
51-54 CONFIG if AMLC line, octal (ignored if not AMLC)		
56-60 LWORD if AMLC line, octal (ignored if not AMLC)		
63-80 Description (optional)		
ID LN STR **X-VALUE** **Y-VALUE** CD CODES ***AMLC***		
NO NO LEN POS LEN DEC POS LEN DEC PS 1CDEF CNFG LWORD DESCRIPTION		
00 00 11 02 05 3 07 05 3 01 1CDEF 0000 00000 (EXAMPLE)		
01 00 11 02 05 3 07 05 3 01 1CDEF 0000 00000 ALTEK		
02 -1 11 02 05 3 07 05 3 01 1CDEF 0000 00000 DIGIT.DATA FILE		
03 xxxxxxxxxxx		

4.4.7 Process Daily-Values Card-Image Data (DV_STORE)

The DV_STORE program is used to store daily-values data within the ADAPS Daily-Values database tables. This section describes the card-image data formats, and indicates how the program runs.

Introduction

The retrieved daily-values data must be formatted as type-2 and type-3 80-column card data. The type-2 card (record) contains the station identifier (ID), parameter code, and statistic code. The type-3 card contains the daily-values dates and data. For each complete water year of data, there are 48 type-3 cards (4 per month). The program runs even if other types of cards (such as Z, H, or N) are encountered in the retrieved file. The program processes multiple stations, parameter codes, and statistic codes.

Program Operation

This interactive program goes through the standard ADAPS startup routine and prompts for the input daily-values card file name. This is the name of the input file that contains the type-2 and type-3 card data that were retrieved. Select one of the following three options:

- (1) Add only.
- (2) Add/Replace.
- (3) Add/Merge.

Option 1 is used if no data exist in the Daily-Values File. Option 2 is used if new data will be added and/or old data will be replaced (as if the same input file was processed twice). Option 3 is used to merge (interleave or extend) new and/or old input data with existing data.

For options 1 and 2, blank fields on the cards are set to a value that indicates "missing data" within ADAPS. Also, if card fields are equal to 999999 or 999998, they are set to the missing value as well.

If there is a change in the input station ID or parameter code during processing, the program prompts the user to select a new data descriptor from the list of DDs defined for the appropriate station; therefore the DDs must be defined for all data that are to be processed. If there is more than one DD for the parameter being processed, the program pauses and prompts for the desired DD selection. After the DD selection is made, the program continues to process the card data. During processing, the program displays each type-2 card data found and also lists the water year being processed based on the type-3 cards. If a type-N card is found, the station name is also displayed.

When card processing is finished, the program summarizes the processing by listing counts (tallies) of total cards (records) processed and daily-values records written to the Daily-Values File. A count of records not written to the file is also given.

4.4.8 Process WRD Standard Input Data (STD_STOR)

The STD_STOR program is used to store field-recorded data (unit and daily values) into ADAPS from files in the standard data-input format. The WRD Standard Input Data Format is described in the DECODES User Manual.

The STD_STOR program is used to load data into the ADAPS database from disk files produced by programs such as UV_STORE or DECODES, which convert different formats of electronic field-recorder data into the standard data-input format. The STD_STOR program may be run as a batch job or as an interactive program, loading the

data into the database and producing a log file showing details of the processing. If no errors are found during the processing, the input file is archived and deleted.

Program Operation

The STD_STOR program begins with the ADAPS startup routine used for specifying the user's work directory, the database, and whether the program should be run as a batch or interactively. The user is then queried for the name of the file, which contains the data in WRD Standard Data Input Format. If the file is not located in the user-specified work directory, the complete pathname must be entered. The program then displays the directory name, the file name, the name of the log file that will record all information about the processing of the file, and the current date and time.

Next, the user is asked if primary processing should be run after the entry of the data into ADAPS. If YES, standard computation of each parameter's data is performed using the current processing information, ratings, shifts, and data for that parameter. If batch processing was specified, the program asks if existing data should be overwritten by the data in the input file, and then proceeds as a batch job.

If interactive processing was specified, the program proceeds interactively. In either batch or interactive processing, progress of the program is recorded in the log file, along with any generated error messages. For each site and parameter that has data processed, the program prints a summary, which includes the site name, parameter name, the type of data, and the number of data values. If processing interactively and existing data are encountered that will be overwritten by data from the input file, the program prints a warning message and asks permission to overwrite the existing data. If the answer is YES, the program will store the data from the input file into the database, overwriting the existing data. The warning message and query may be repeated during processing of each input file if data is found in the database. If the user answers NO to the query, the program stops processing the input file; however, any data processed prior to the warning message stays in the database. If the program is being run in batch mode, the process depends upon the answer given by the user before submitting the batch job. If the user specified "Yes" to the prompt about overwriting existing data, the program will store the data over the existing data and log the occurrence. If the answer was "No", the program will skip processing of the input file, log the occurrence, and proceed with the next input file

<u>NOTE</u>: If using STD_STOR to reload data for reprocessing, or whenever significant amounts of data are to be overwritten, the program should be run in <u>batch</u> mode. This will prevent the user from having to answer the query about overwriting data over and over again. If the program is being run in interactive mode, it will query for the proper action every time data is found in the database. The only other way to avoid this repeated query is to use the UV_DELMEAS program to delete the measured Unot Values and recompute the record to wipe out other values derived from the measured UVs.

If the processing is completed without errors, the input file is copied to the archive directory named /usr/opt/nwis/data/to_tape/archive and the program deletes the original input file. A message notifies the user that the input file has been archived and displays the name of the archive file. If a major error is found, the processing is aborted. If running in interactive mode, the program then asks if the user wishes to process another input file. If YES, the program returns to the user information display. If NO, the program stops and returns to the ADAPS menu.

Processing Messages

Several messages are displayed during processing of an input file. The most common are information or status messages, such as which site and parameter are currently being processed. Error messages are also displayed. These messages are displayed to the user's screen and written to the log files as well.

4.4.9 Enter/Update/Display Measurements (MS_EDIT)

The MS_EDIT program allows the user to update and display measurements. Gaging station inspection data are also processed using this program.

Introduction

This program allows the user to enter, update, delete, list, and retrieve/print discharge measurement data, crest-stage gage (CSG) inspection data, and gaging station inspection data. Once discharge measurement data are stored for a surface-water site, this data can be utilized by the shift-analysis program to perform a preliminary stage-discharge rating shift analysis.

The program has menu options that appear on the screen. The available options are:

- 0 Change setup specifications.
- 1 Manually enter measurement/inspection data.
- 2 AquaCalc enter measurement/inspection data.
- 3 Update measurement/inspection data.
- 4 Delete measurement/inspection data.
- 5 List measurement/inspection data.
- 6 Retrieve/print measurement/inspection data.

Each of these options is described in the following sections of the manual.

Change Setup Specifications

This option restarts the program and allows the user to change information such as station ID, pathnames, and output medium.

Manually Enter Measurement/Inspection Data

This option allows the user to enter new discharge measurement data, CSG inspection data, or gaging station inspection data for a surface-water site. A list of variables that can be entered are as follows:

- 1. The most recent measurement number/data entered is displayed if any measurements have been previously stored for the current station. Enter either the new measurement number to be stored, C for a CSG inspection, G for a gage inspection, or <CR> to return to the program menu level. A valid measurement number can range from 1 to 99997, and can have a single uppercase letter (A to Z) at the end. For example, 12, 456A, and 99995Z are all valid measurement numbers. Note that for a single station, exact duplicate numbers are not allowed. Therefore, 10A and 10B are considered different measurement numbers by the program. If a duplicate measurement number is accidentally entered, an error message appears.
- 2. Enter the measurement/inspection date as MM/DD/YY (month/day/year). For a single station, only one entry of CSG or gaging station inspection data can be stored for a given date. However, there is no limit to the number of discharge measurements that can be stored for the same date. If a duplicate CSG or gaging station inspection date is accidentally entered, an error message appears.
- 3. If known, enter the starting time the measurement was made as HHMM (hours and minutes). This value is used in conjunction with change in time of gage height (item 19 listed below) in some programs to plot time of measurement.
- 4. Enter the field party (one or two people) using initials as Initials/Initials. For each person's initials, enter up to three letters. Only non-blank characters are acceptable for one person's initials. For two people, enter the first set of initials, a slash (/), then the second set of initials. Note that a slash is the only acceptable delimiter when entering two separate initials.

Enter all remaining discharge measurement data (variables 5-25 and 29 below). If entering a gaging station inspection, only those variables marked with an asterisk (*) are stored. If entering a CSG inspection, enter variables 26-29. In order to skip a specific variable, press the carriage return in response to the prompt. In order to enter a zero (0) value for certain variables (8, 9, 10, 11, 15, 18, 21, 22, 26, 27), a zero must be entered before pressing the carriage return.

Variables (continued)

- 5. Channel width (ft).
- 6. Cross-sectional area (sq ft).
- 7. Mean velocity (ft/sec).
- 8. * Inside gage height (ft).
- 9. * Outside gage height (ft).
- 10. First discharge (cfs).
- 11. Second (adjusted) discharge (cfs).
- 12. First discharge description code.
- 13. Second discharge description code.
- 14. Current rating in use.
- 15. Percent difference from current rating.
- 16. Applied shift adjustment (ft).
- 17. Number of sections measured.
- 18. Change (ft) in gage height (stage).
- 19. Change (hours) in gage height (stage).
- 20. Measurement rated as excellent (E), good (G), fair (F), or poor (P).
- 21. * Air temperature (degrees).
- 22. * Water temperature (degrees).
- 23. Base flow code (1 = No, 2 = Yes).
- 24. * Control condition code.
- 25. Measurement type code.
- 26. Upstream CSG reading (-888 = No mark) (ft).
- 27. Downstream CSG reading (-888 = No mark) (ft).
- 28. Staff or reference point reading (ft).
- 29. Remarks (0-100 characters).

When new CSG data (variables 26-29) are entered to the file, the upstream and downstream pin elevations are stored along with the input CSG inspection data for later use. (They are not stored in site file anymore.)

The table below is a list of minimum, maximum, and missing values used for measurement/inspection data.

Variable	Minimum	Maximum	Missing
*1	1	99997	Blank
2	01/01	12/31	Blank
3	0000	2400	Blank
4			Blank
5	0	99999	0
6	0	99999	0
7	0	99	0
8	-99.99	99.99	-999
9	-99.99	99.99	-999
10	-99999	999999	-999
11	-99999	999999	-999
12	0	8	0
13	0	8	0
14	1	99.9	0
15	-999	999	999
16	-99.99	-99.99	0
17	0	999	0
18	-99.99	99.99	-999
19	0	24	0
20			Blank
21	-99	150	-999
22	-99	150	-999
23	1	2	Blank
24	0	7	0
25	0	10	0
26	-888	99.99	-999
27	-888	99.99	-999
28	0	99.99	-999
29			Blank
			bers; also single letters C
or G are allow	ed to be entered	l .	

Minimum, maximum, and missing measurement/inspection file values

Once all appropriate data are entered, the user can correct any error by entering the variable number to be updated. See the following restrictions concerning updating discharge measurement numbers and CSG inspection or gaging station inspection dates. Entering the number 99 returns the user to the program menu level.

AquaCalc Enter Measurement/Inspection Data

This option is used to automatically enter most new discharge measurement data by reading a download file from an Aquacalc* discharge measuring device. The AquaCalc 5000 is a streamflow computer used to automate the making and computation of discharge measurements. It can store nine measurements (transects), which can be downloaded to separate files with the provided software or other communications software. These measurement files can then be used as input for the ADAPS MS_EDIT program. The user is prompted for a file name, and then measurement data contained in

the file is extracted. Any data that can be stored in the measurement file that is not contained in an Aquacalc download file is prompted for, as in the section above.

*Use of name in this manual is for identification purposes only and does not constitute endorsement by the U.S. Geological Survey.

Update Measurement/Inspection Data

This option updates any previously stored discharge measurement, CSG inspection data, or gaging station inspection data.

Enter the discharge measurement number to be updated; C for a CSG inspection, G for a gaging station inspection, or a 9 to return to the program menu level. If the measurement number to be updated does not exist for the station, an error message is displayed.

If CSG or gaging inspection data are to be updated, enter the date of the inspection as MM/DD/YY. If the inspection to be updated does not exist for the station, an error message is displayed.

The information currently stored for the selected measurement or inspection is displayed. Enter either the variable number to be updated or a 99 to return to the program menu level. If a CSG inspection is selected for updating, the program checks to see if the current upstream and/or downstream pin elevations stored for the inspection differ from the pin elevations stored in the Site File before exiting back to the program menu level. If they differ, the user can update the CSG inspection pin elevations to agree with those in the Site File.

When updating the measurement number (variable 1 above), be sure that the new number does not match an existing number stored for the station. If the numbers match, an error message is displayed. The same applies when updating a CSG or gage inspection date. Also, it is illegal to change discharge measurement to CSG inspection or gaging station inspection data, or vice versa, by updating variable 1.

Delete Measurement/Inspection Data

This option deletes any previously stored discharge measurement, CSG inspection data, or gaging station inspection data.

Enter either the discharge measurement number to be deleted, C for a CSG inspection, G for a gage inspection, or 9 to return to the program menu level. If the measurement number to be deleted does not exist for the station, an error message is displayed.

If a CSG or gage inspection is to be deleted, enter the date of the inspection as MM/DD/YY. If the inspection to be deleted does not exist for the station, an error message is displayed.

Once the selected measurement or inspection data have been deleted from the file, the user can delete another measurement or inspection entry, or return to the program menu level.

List Measurement/Inspection Data

This option prints a summary of all discharge measurement, CSG inspection data, and gaging station inspection data stored for a single station or for a group of stations. This summary can be printed on a line printer or at a terminal. After all printing/display is finished, the user is returned to the program menu level.

Retrieve/Print Measurement/Inspection Data

This option retrieves and prints discharge measurement, CSG inspection data, and gaging station inspection data in a tabular format, either on a line printer or a terminal. The user can retrieve/print data for a single station or for a group of stations. Following is a list of steps to retrieve/print data:

- 1. Enter data type (1 = Discharge measurement/gaging station inspection, 2 = CSG inspection, 3 = Both types).
- 2. Enter a starting 4-digit water year. If a water year is not specified, data retrieval is not based upon water year and steps 3 and 4 below are bypassed. If an 8888 is entered, all stored information for the selected data type(s) is retrieved, and steps 3-6 are bypassed.
- 3. Enter an ending 4-digit water year. If not specified, it will match the starting water year.
- 4. Choose whether or not data retrieved for a given water year should also include any data stored within three months of the end of the water year (July to September of the previous water year, or October to December of the succeeding water year).
- 5. If discharge measurement data are being retrieved, enter minimum and maximum measurement numbers, separated by a comma. If not specified, the data retrieval is not based on a minimum and maximum measurement number range.
- 6. Enter the minimum discharge value (cfs) to be retrieved. If not specified, the data retrieval is not based on a minimum discharge value.
- 7. Two report formats are available: A relatively long format which includes all the fields stored for a particular measurement, and a shorter format which includes the fields as recorded on Form 9-207. Enter the choice of format at this time. Also, an option is provided to omit gage inspections from the report.
- 8. If a multiple station retrieval is selected, wait while the program searches the Site File to find the stations that satisfy the retrieval specifications. If no stations are retrieved, an error message is displayed. Otherwise, the number of sites retrieved is displayed. If the user does not print the data for the retrieved sites, the program exits to the program menu level.

For each selected station number, the program checks which stored measurement or inspection data satisfies the given retrieval specifications. The data that satisfies the specifications are printed in tabular format. When printing CSG inspection data tables, the program uses any stored upstream and downstream readings and pin elevations to compute; if possible, upstream and downstream peak gage heights are used. After all printing is finished, the user is returned to the program menu level.